IN THE SPECIFICATION

Please amend the following paragraphs as follows.

[0013] To achieve these and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, the invention provides a method of fabricating a deep trench capacitor. First, a substrate with a patterned liner layer and a patterned mask layer thereon, and a deep trench therein is provided. Furthermore, a bottom electrode has already been formed in the substrate at a bottom of the deep trench ~~in the substrate~~ and a capacitor dielectric layer has already been formed on the surface of the deep trench. Thereafter, a first conductive layer is formed at the bottom of the deep trench. A protective layer is formed on the mask layer and the surface of the deep trench. The protective layer is formed in a plasma-enhanced chemical vapor deposition process. In the plasma-enhanced chemical vapor deposition process, the depositing rate on a horizontal surface is higher than on a vertical surface so that the vertical surface of the deep trench is coated with a thin protective layer. A collar oxide layer is formed on the surface of the protective layer. The protective layer and the collar oxide layer on the surface of the first conductive layer are removed.

[0016] This invention also provides an alternative method of fabricating a deep trench capacitor. First, a substrate with a patterned liner layer and a patterned mask layer thereon and a deep trench therein is provided. Furthermore, a bottom electrode has already been formed in the substrate at a bottom of the deep trench ~~in the substrate~~ and a capacitor dielectric layer has already been formed on the surface of the deep

trench. Thereafter, a first conductive layer is formed at the bottom of the deep trench. A collar oxide layer is formed on the mask layer and the surface of the deep trench. The collar oxide layer on the surface of the first conductive layer is removed. Material is deposited into the deep trench to form a material layer. A portion of the material layer inside the deep trench is removed to form a first opening such that the upper surface of the material layer is at a level higher than the liner layer. Thereafter, the collar oxide layer not covered by the material layer is removed. A portion of the mask layer on the sidewall of the first opening is removed to form a second opening having a width greater than the first opening. The material layer is next removed. Conductive material is deposited into the deep trench to form a second conductive layer. A portion of the second conductive layer at the top of the deep trench is removed so that the second conductive layer only partially fills the deep trench. The collar oxide layer on the sidewall of the deep trench not covered by the second conductive layer is removed. Finally, conductive material is deposited into the deep trench to form a third conductive layer that completely fills the trench.

[0027] As shown in Fig. 2C, a thermal processing of the substrate 200 is carried out so that dopants within the doped insulating layer 208a diffuse into the substrate 200 at the bottom of the deep trench 206 ~~in the substrate 200~~ to form a doped region 214. The doped region 214 serves as a bottom electrode in the final deep trench capacitor. Since the insulating layer 212 over the surface of the deep trench 206 is effective in stopping the outward diffusion of the dopants from the doped insulating layer 208a, the diffusion of dopants is constrained within the bottom of the deep trench 206.

Thereafter, the doped insulating layer 208a and the insulating layer 212 at the bottom of the deep trench 206 are ~~is~~ removed. The insulating layers 208a and 212 are removed, for example, by performing a wet etching process using buffered hydrofluoric acid (BHF) or diluted hydrofluoric acid (diluted HF) as the etchant.